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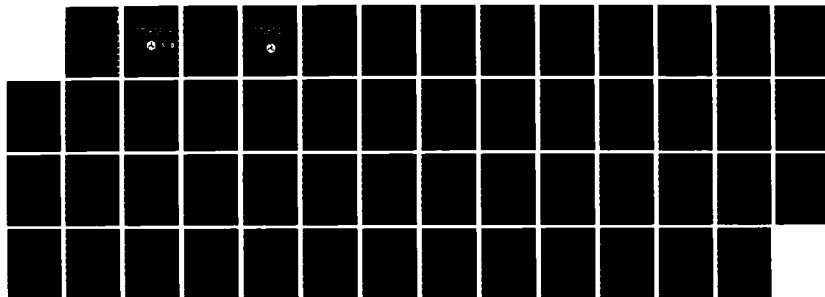
A PRELIMINARY EVALUATION OF TRANSFER OF SIMULATOR
TRAINING TO THE REAL WORLD(U) NATIONAL MARITIME
RESEARCH CENTER KINGS POINT NY COMPUTER AID.

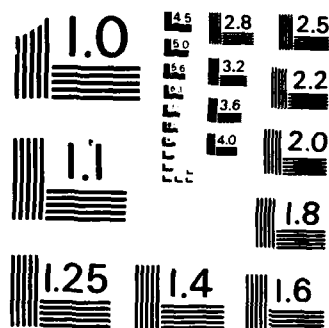
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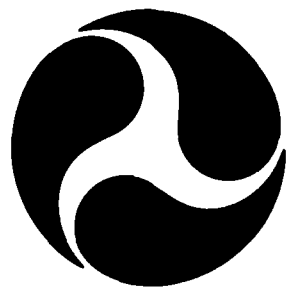
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AD-A169 755

CAORF 50-8126-02

TECHNICAL REPORT
SIMULATION EXPERIMENT

A PRELIMINARY EVALUATION OF
TRANSFER OF SIMULATOR TRAINING
TO THE REAL WORLD



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> This experiment represents the first attempt to study the transfer of training from the CAORF Ship Simulator to the real world. First class midshipmen from the U. S. Merchant Marine Academy served as test subjects. Half the group had no simulator experience while the other half had participated in a ten-week simulator training program. Both groups were tested on a range of sailing tasks in the New Haven Channel on the Academy's training vessel, the T/V KINGS POINTER. The superior performance of the simulator-trained group over the non-trained group, indicates that skills acquired on the CAORF simulator may indeed be transferred to an actual shipboard task.

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Transfer of Training.

17b Identifiers/Open-Ended Items

17c COSATI Field/Group

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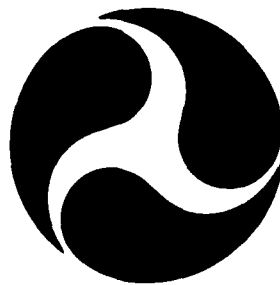
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**TECHNICAL REPORT
SIMULATION EXPERIMENT**

**A PRELIMINARY EVALUATION OF
TRANSFER OF SIMULATOR TRAINING
TO THE REAL WORLD**

By

Anita D. D'Amico
William C. Miller
Christine Saxe
CAORF Research Staff



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EXECUTIVE SUMMARY

INTRODUCTION

This experiment is one of a series of studies designed to evaluate the ongoing Cadet Training Program at the CAORF ship simulator located at the U.S. Merchant Marine Academy, Kings Point, New York. This particular study represents the first attempt to address the issue of transfer of simulator-trained watchstanding skills to real-world performance.

METHODOLOGY

Two groups of six first-class midshipmen were evaluated on a range sailing task. Those in Group 1 had participated in the ten-week simulator training course, while those in Group 2 had no simulator experience. The two groups were taken separately on the Academy training vessel, the T/V KINGS POINTER, to New Haven, Connecticut, where the entrance channel is marked by a range.

The task consisted of assuming the conn at the sea buoy and sailing the entire first leg of the entrance channel keeping the range lights aligned. Each run took approximately 45 minutes.

PERFORMANCE MEASURES

Much of the data collected during this experiment was subjective. Three performance measures were used: an evaluation form, a rating based on radar plots, and a rating based on the ship's course recorder. The evaluation form assessed

the cadet's performance in the areas of watch relief, watchstanding, and range sailing; radar fixes were taken every 60 seconds and a rating given; a rating was assigned based on data from the course recorder, which indicates deviations off the intended course.

RESULTS

Differences between groups on the three performance measures were tested using a Mann-Whitney *U* Test. Subjects in Group 1, the simulator-trained group, performed better than those in Group 2, the untrained group, on all three measures. These differences were statistically significant for two of the measures: the subjective evaluation form and the course recorder rating.

CONCLUSIONS

Because this study was the first to examine real world behavior, it is recognized that there may be certain drawbacks in the experimental design and data collection techniques. Despite its possible shortcomings, this experiment did demonstrate the overwhelmingly superior performance of cadets trained on the CAORF simulator over those with no previous simulator experience. It may be safely concluded that the simulator program greatly enhances performance on a real-world shiphandling task. Additional research will expound on this important finding.

1. INTRODUCTION

In the Spring of 1981, the United States Merchant Marine Academy, Kings Point, New York contracted with the Maritime Administration's (MARAD's) Computer Aided Operations Research Facility (CAORF) to develop a simulator training program designed to supplement the existing Cadet Shipboard Training Program and Training Vessel Program and to systematically evaluate the effectiveness of various program characteristics. The aim of the program is to teach deck cadets the duties and responsibilities of a licensed third mate. At present, the midshipmen spend a total of approximately ten months at sea on as many as five or six different merchant vessels. Assignment to these ships is determined in large part by scheduling constraints. For this reason, the quality and quantity of actual "hands-on" training that the midshipmen receive is not necessarily consistent. Simulator training serves to ensure that certain critical aspects of the bridge watch, which may have been given insufficient attention during the sea year, are mastered in a simulated environment. CAORF's role in this program is: to develop training objectives and simulator based training tools; to evaluate the effectiveness of the program, to suggest modifications to the program and, if implemented, test their effectiveness; and to systematically evaluate issues related to the training effectiveness. This report is one of a series published on this topic. It addresses the important issue of transfer of simulator training to the real world.

To date, the performance of first class midshipmen (fourth-year cadets) from seven academic sections has been evaluated. Three categories of skills have been examined: basic shiphandling, Rules of the Road, and passage planning. One aspect of passage planning, sailing a range (to stay in a harbor entrance channel), was selected to be used as the basis for evaluating the transfer of simulator training to the real world.

2. METHODOLOGY

The performance of two groups of midshipmen, one with simulator training and one without, was compared using a real-world range sailing task as the basis for comparison. The USMMA training vessel, the T/V KINGS POINTER, was used to make two trips to New Haven, Connecticut, where the harbor entrance channel is marked by a range (see Appendix A). Subjects were twelve (12) first class midshipmen. All volunteered to participate in the project. Those in Group 1 had had the simulator training course just prior to their cruise, those in Group 2 had not had the simulator course. All twelve

had been at sea for approximately 10 months, but none had ever sailed into New Haven Harbor.

As previously mentioned, two separate trips were made. The experiment was conducted two hours before maximum flood current, at night, under conditions of calm sea and clear sky. The current for Group 1 varied from 0.5 knots to 1.5 knots, and for Group 2, from 1.4 knots to 2.5 knots. The current was always setting in a westerly direction.

The midshipmen were paired into watch teams standing four-hour watches. Once out of the basin at Kings Point, the watch teams conned the vessel for a licensed officer standing by. While underway to and from New Haven, the midshipmen practiced navigation, course changes, and maneuvering for traffic. Fourth classmen (first-year cadets) served as helmsmen. Upon arrival at New Haven, the teams were split such that one midshipman conned the tug alone while the other went to the chart room (isolated from the bridge) to determine the strength of the current, buoy lighting characteristics, and his intended course of action. During the course of the actual experiment, only one first classman (subject) was on the bridge at a time. Ship speed was kept constant at approximately 8 knots. All navigation was done visually; subjects were not allowed to use the radar.

Each experimental run took approximately 45 minutes. At the start of each run, the midshipman maneuvered the tug around the Sea Buoy "NH" and into the Entrance Channel. Sailing as close on the range as possible, the midshipman conned the vessel to Buoy "8" whereupon the captain assumed the conn and turned the vessel around. The midshipman then conned the vessel outbound to the sea buoy where the watch transfer took place and the next midshipman repeated the maneuver.

The range lights marked the center of the channel. The Outer Channel Range Front Light and Rear Light were Flashing Green (F.G.) characteristic, visible on rangeline only, and readily visible at night. Entrance Channel was marked by gated buoys, but Buoys "2" and "3" were unlighted (Buoy 2 a red nun with red reflector and Buoy 3 a black can with green reflector). The experimenters timed the runs to avoid outbound traffic in the channel, several runs were delayed for this reason.

3. PERFORMANCE MEASURES

The evaluation of the midshipmen's performance was largely subjective. To reduce variability and make the rating procedure as consistent as possible, two steps were taken: first

the same evaluators were used for both groups of midshipmen; second, three separate methods of evaluating performance were used for all midshipmen.

One evaluator was an Academy instructor holding the license Master of Freight and Towing Vessels not over 1000 Gross Tons upon Oceans; the other was a member of the CAORF staff and a licensed third mate.

3.1 EVALUATION FORM

An evaluation form (Appendix B) was used to assess the cadets' performance in three areas: the watch relief, the watch itself, and sailing on the range. This form consisted of various "yes/no" questions as well as subjective rating scales.

3.2 RADAR PLOTS

Radar plots for each subject's run were generated. Radar fixes from the same object were plotted every minute and a rating was then assigned to the overall run.

3.3 COURSE RECORDINGS

The ship's course recorder was also used to assess performance. The number of deviations off course was examined, and a rating was again assigned to each run.

4. RESULTS

All scores were recorded on the results sheet (Appendix C) and converted to percentages. An overall score for each midshipman was generated by computing a mean score from the three separate performance measures. Total group means were then computed and compared.

4.1 SUBJECTIVE EVALUATION FORM

The simulator-trained group (Group 1) scored approximately twice as high as the untrained group (Group 2) on the Subjective Evaluation. Group 1 also appeared to be better prepared than Group 2 in the three areas of watch relief, watchstanding, and trackkeeping. Individual percentage scores and group means are presented below:

	Group 1	Group 2
Individual	74.4	25.6
Scores	60.5	41.7
	73.7	39.6
	86.0	40.6
	76.3	18.7
	79.1	58.1
Group Mean	75.0%	37.4%

A Mann-Whitney *U* Test was performed on these scores to ascertain whether the differences between the two groups were statistically significant. Results yielded a $U = 0$, which is significant at $p < 0.001$.

4.2 RADAR PLOTS

Examination of the radar plots revealed that the simulator-trained group again scored higher than the untrained group; that is, they demonstrated a greater ability to keep the vessel in the channel. Although some of the subjects in Group 1 were not able to stay on the range, subjects in Group 2 experienced considerably more difficulty staying in the channel. Two runs of Group 2 had to be terminated early because the midshipmen were unable to guide the vessel into the channel at all. The radar plots are presented in Appendix D.

It should be noted that the difference in group means would have been much greater (36 points versus 25 points) had it not been for one particular subject in Group 1 who scored considerably lower than the rest of the group. Individual scores and group means appear below:

	Group 1	Group 2
Individual	60	0
Scores	10	60
	60	40
	80	60
	100	0
	80	80
Group Mean	65.0%	40.0%

The difference between Groups 1 and 2 (including the low scoring subject in Group 1) was not statistically significant using a Mann-Whitney *U* Test.

4.3 COURSE RECORDER

On this third performance measure, Group 1 again scored much higher than Group 2. The simulator-trained group, on the whole, steered much straighter courses with fewer course changes than Group 2, the untrained group. The course recorder results are shown in Appendix E. Again, because of the poor performance of one individual in Group 1, the difference between groups was reduced. These scores appear below:

	Group 1	Group 2
Individual	100	0
Scores	10	20
	60	20
	100	60
	60	0
	60	40
Group Mean	65.0%	26.7%

This difference between the two groups was statistically significant at $p < 0.06$, using a Mann-Whitney U Test.

4.4 TOTAL GROUP MEANS

The total mean scores for each group reflect the superior performance of Group 1. The total mean scores were:

Group 1	68.3%
Group 2	34.7%

All aspects of the scoring reflect this trend. Individual and total group score sheets may be found in Appendix F.

5. CONCLUSIONS

From the results of this experiment, it may be inferred that the simulator program enhances the midshipmen's performance level of the duties of a third mate in the real world. The better real world performance of the simulator-trained group was evident in all five performance measures. Of the four measures which were subjected to statistical testing, three demonstrated statistically significant differences between the groups in the hypothesized direction.

This study serves to enhance confidence in the transferability of CAORF simulator training to the real world. It is strongly recommended that the existing simulator training exercises continue to be used as a supplement to the current academic program.

6. DISCUSSION

While this study demonstrated quite dramatically that simulator-trained midshipmen perform better on a real-world range sailing task than non-trained midshipmen, it must be noted that this experiment did contain certain problems which may have affected the results.

Firstly, the two groups of subjects (trained and non-trained) were evaluated on two separate trips on the training vessel, thereby introducing the confounding effects of differing environmental conditions. The current was somewhat stronger for Group 2, the untrained group, which may have affected the subjects' ability to hold the vessel steady on the range. A more desirable method of evaluating the two experimental groups of midshipmen would have been to split up the groups and test three of each on the two trips. With this method, any variability in environmental conditions would have been experienced equally by subjects in both groups.

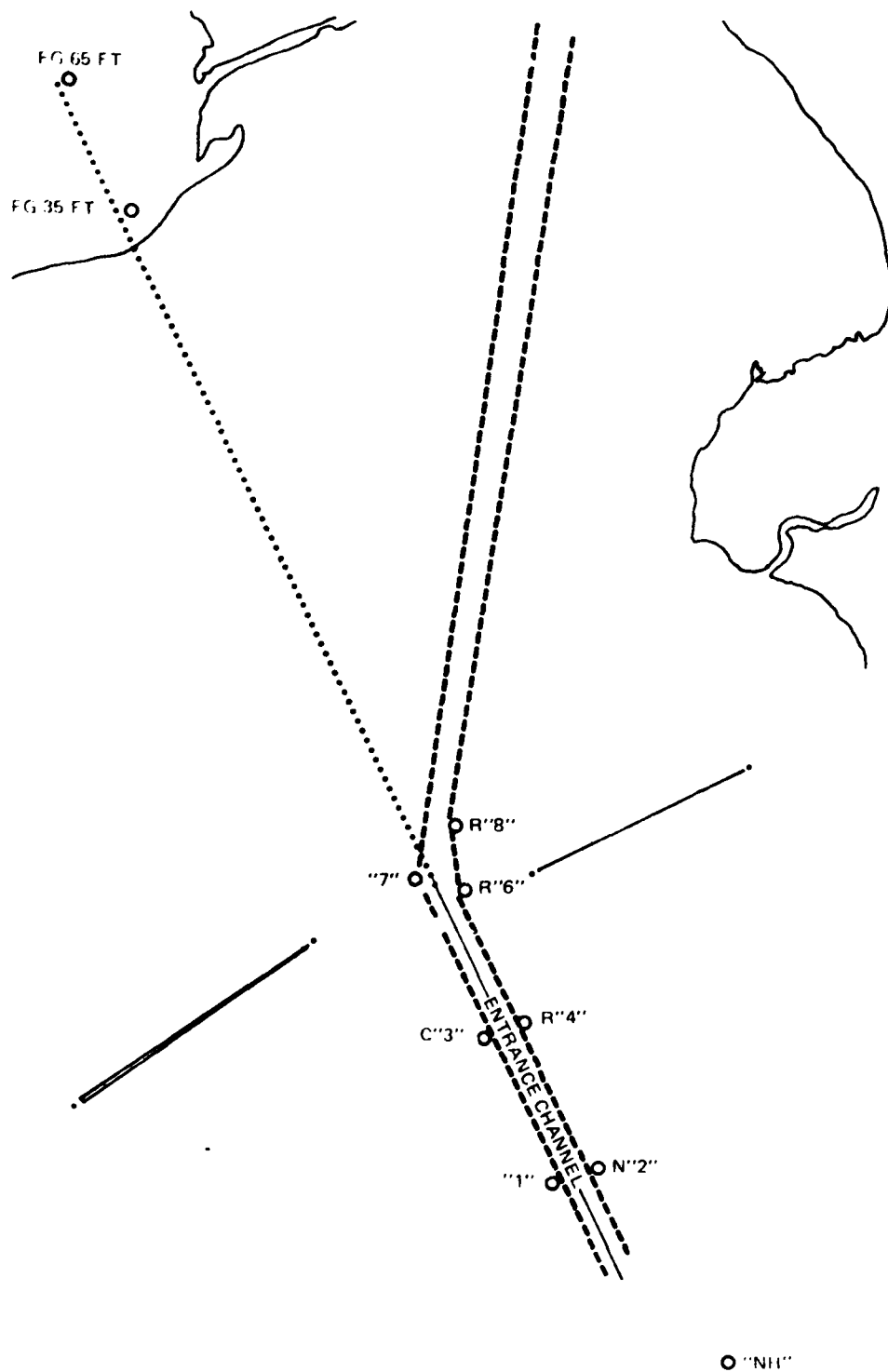
Secondly, the starting positions of the vessel for the two groups of subjects were different. Group 1 was started in the general vicinity of the mouth of the channel, while Group 2 was started somewhere near the Sea Buoy "NH." The differences in initial position and heading between the two groups may have given the experienced group an advantage over the inexperienced group. These two factors should have been under greater control to ensure uniform treatment of all test subjects.

Finally, there may have been a deleterious effect of helmsman on all subjects. Only helm orders, such as "20° right," were given; helmsmen were not asked to steady on a course. Despite this, however, many helmsmen were so inexperienced that they had difficulty following these simple rudder orders. While it is desirable to allow underclass midshipmen to participate in training exercises for their own training, it may have affected the experimental results to permit inexperienced helmsmen in this experiment. Several different helmsmen were used each night with little experimental control over levels of ability and experience.

The authors wish to stress that this study was a preliminary evaluation. A pioneer experiment, by definition, is exploratory and can be expected to be improved upon. Despite some drawbacks in its design, however, this study did reveal some very profound results. Future research in this area will be conducted in a similar manner; however, efforts will be made to eliminate experimental confounds and develop new and more objective methods of data collection.

APPENDIX A

New Haven Entrance Channel Chartlet



New Haven Entrance Channel

APPENDIX B

Subjective Evaluation Form

CADET TRAINING/RETENTION

New Haven Evaluation Form

Cadet _____ Evaluator _____

Time _____

Weather _____

Sea State _____

Current _____

Scenario — Open Sound _____ New Haven Entrance _____

Please answer each question to the best of your ability using the knowledge and experiences you have gained from your time at sea. The evaluation questions which are your subjective opinions should be marked on a fair scale which you have developed.

On the New Haven Entrance please use the chartlet to plot the T/V Kings Pointer's position on a frequent basis. This chartlet will be used to measure the cadet's trackkeeping ability. Use the radar or any other means to fix your position.

I RELIEVING THE WATCH

A	Determining Position:	<div>1</div>	<div>2</div>
1	Asks for, or is given, position on chart.	Yes	No
2	Plots own position.	Yes	No
B	Requests Traffic Information:		
1	Asks to be shown traffic:		
a.	on radar	Yes	No
b.	visually	Yes	No
2	Asks past action of traffic.	Yes	No
3	Asks if there have been any communications.	Yes	No
4	Asks present CPA's of traffic ships.	Yes	No
C	Ownship Information:		
1	Requests information on:		
a.	course steered	Yes	No
b.	course made good	Yes	No
c.	engine speed	Yes	No
d.	speed made good	Yes	No
e.	other _____		
D.	Navigation Aids:		
1.	Requests location of pertinent aids:		
a.	on radar	Yes	No
b.	visually	Yes	No

E Overall Opinion of the Watch Relief:

- Please check the appropriate box indicating your subjective opinion as to the cadet's performance on relieving the watch.

1	2	3	4	5
<div></div>	<div></div>	<div></div>	<div></div>	<div></div>
<div> <div>poor</div> <div>←</div> <div>→</div> <div>excellent</div> </div>				

- Any comments:

II WATCHSTANDING/TRACKKEEPING

1. Indicate your subjective opinion as to how the cadet treated the following topics:

	1	2	3	4	5
a. traffic					

NA

	1	2	3	4	5
b. change in weather					

NA

	1	2	3	4	5
c. change in current					

poorly ← → very well

2. Please rate the cadet's navigation ability (the accuracy of the fixes):

	1	2	3	4	5

poor ← → excellent

3. In general, rate how frequently the cadet fixed his position:

	1	2	3	4	5

infrequently ← → very infrequently

4. In general, rate the cadet's ability to stay on the range:

	1	2	3	4	5

poor ← → excellent

5. In general, rate the number of helm orders given by the cadet to stay in the channel or on the range.

	5	4	3	2	1

few ← → overabundant

6. Rate the overall ability of the cadet regarding his watchstanding capabilities. Please include the cadet's level of confidence as well as his scores on the above items.

	1	2	3	4	5

poor ← → excellent

7. Any comments:

APPENDIX C

Instructions for Scoring the Results

INSTRUCTIONS FOR SCORING THE RESULTS

1. New Haven Evaluation Form

The evaluation form is scored by either yes/no or on a scale. The yes/no questions are 1 point for a yes and 0 points for a no. The scaled questions are given the value appearing above the checked box.

If any question is deemed N/A, then the question is completely omitted from the scoring for that cadet. The highest possible score for the evaluation form (line 1B) is derived by adding up the highest possible score for each question that was not deemed N/A.

The highest possible score and the total score (addition of all questions scored) should then be placed on the tally sheet on lines 1A and 1B respectively. The percentage of these two scores should be entered on line 1C.

2. Physical Measurements

The physical measurements are broken into two parts. The first part is for scoring the radar fixes. This is a subjective rating on a scale of 1 to 5 with regard to the fixes obtained during the range maneuvers. Five is the highest score obtainable. The percentage of the actual score over the maximum score of five should be recorded on line 2B.

The second physical measurement deals with the course recorder. The evaluator should examine the course recorder and assign a subjective rating to the results (line 2C). The fewer deviations from the course the higher the score with five the maximum score. The percentage of line 2C over five should be entered on line 2D.

3. Total Score

The average percentage correct will be used for the "individual average" score. This provides an indication as to how far the cadet was from the total perfect score.

To accomplish the "total score" add lines 1C, 2B and 2D together and divide by 3. Enter this value in the box for number 3.

4. Total Group Score

The scores from line 3 for each of the cadets in the same group should be entered. The total score should then be divided by the number of cadets in the simulator group. The scores from each group will then be used to compare performance.

CADET TRAINING/RESEARCH PRACTICAL EXERCISES EVALUATION FORM

CADET _____

SIMULATOR GROUP Experience or Inexperienced

Evaluators — Visual

Radar

1. Evaluation form

A Highest Possible Score: _____

B Total Score _____

C Percentage B/A _____

2. Physical Measurements

A Radar Fixes (Scale 1 to 5): _____

B Percentage A/5: _____

(1 is Poor; 5 is Excellent)

Comments: _____

C Helm Orders —

Course Recorder

(Scale 1 to 5): _____

D Percentage C/5: _____

(1 is Overabundant; 5 is Few)

Comments: _____

3. Individual Average Score

(1C + 2B + 2D)/3:

--

4 Total Group Score

A Simulator Experienced Group

Cadet

Individual Average Score (Line 3 Individual Forms)

1

2

3

4

5

6

Total

Avg. Score

B Simulator Inexperienced Group

Cadet

Individual Average Score (Line 3 Individual Forms)

1

2

3

4

5

6

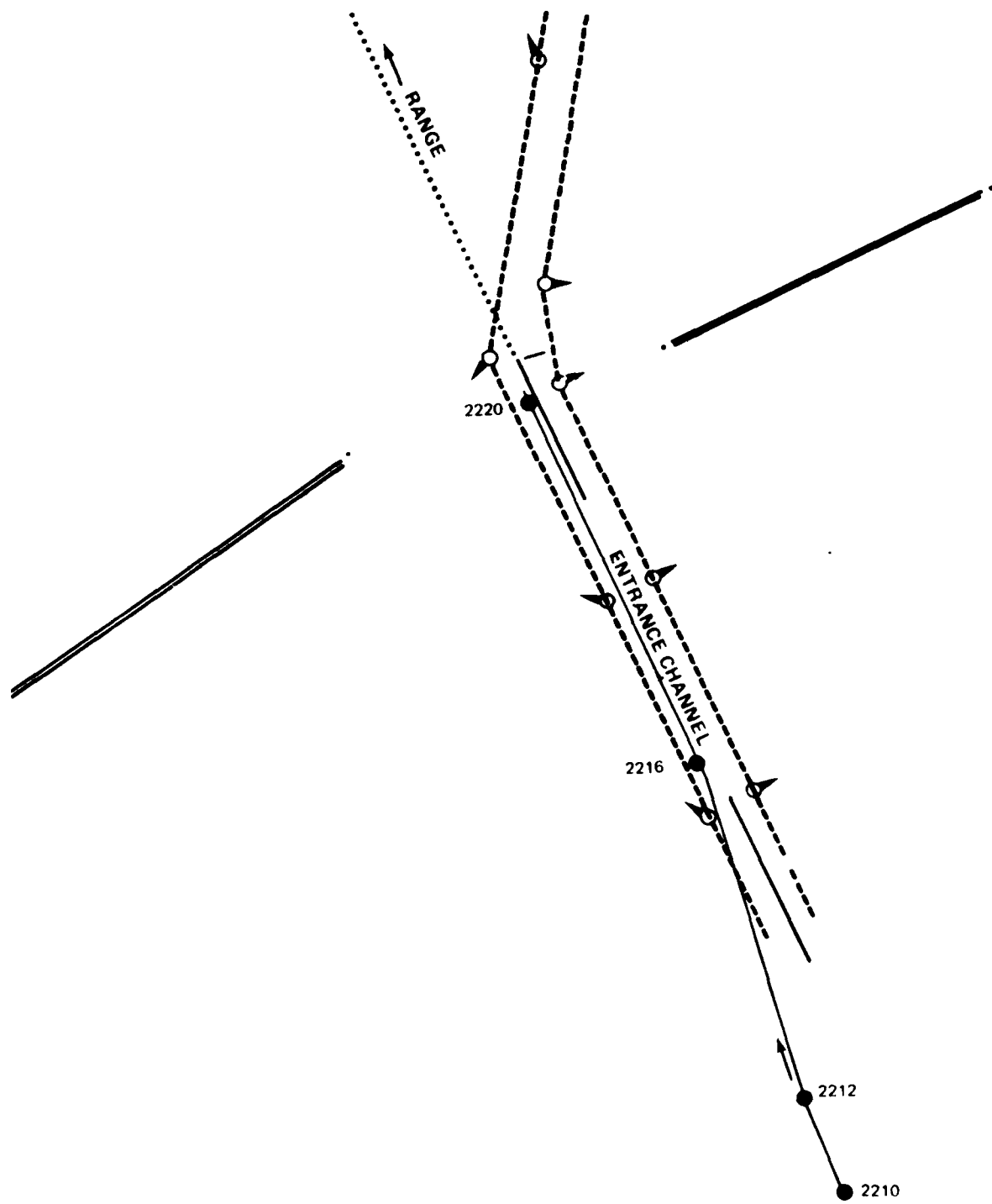
Total

Avg. Score

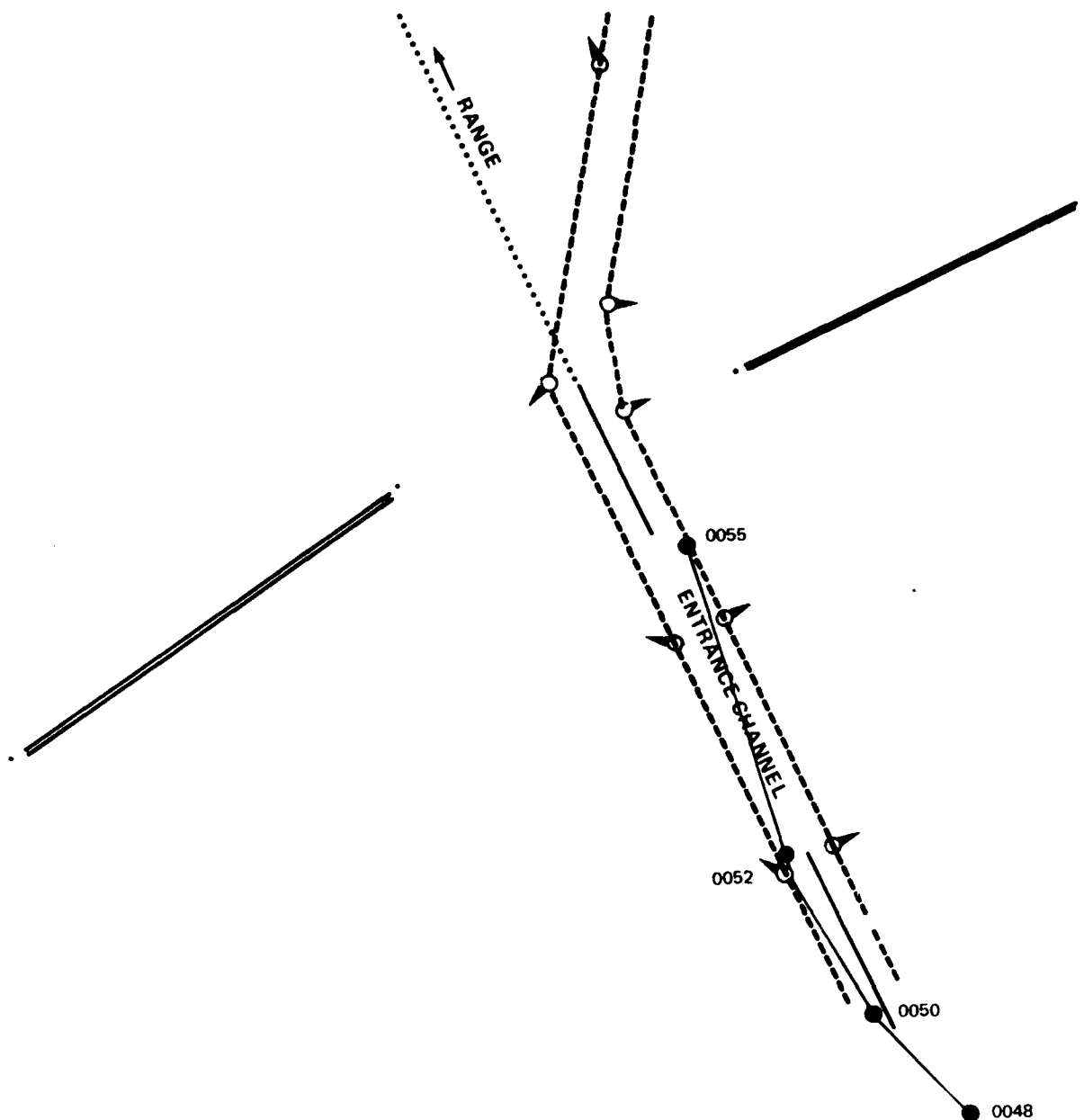
APPENDIX D

Radar Plots

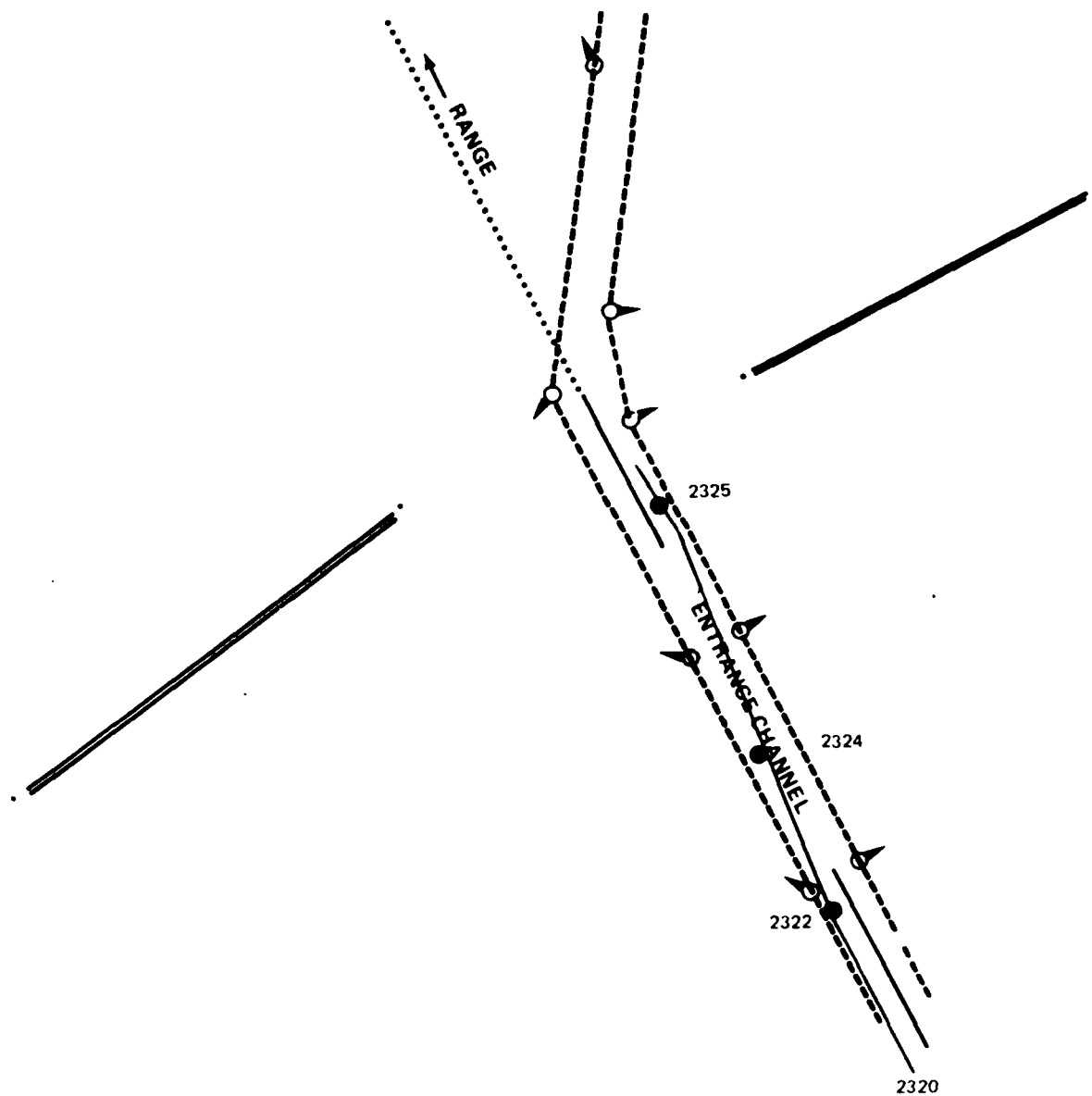
GROUP I — RADAR PLOTS



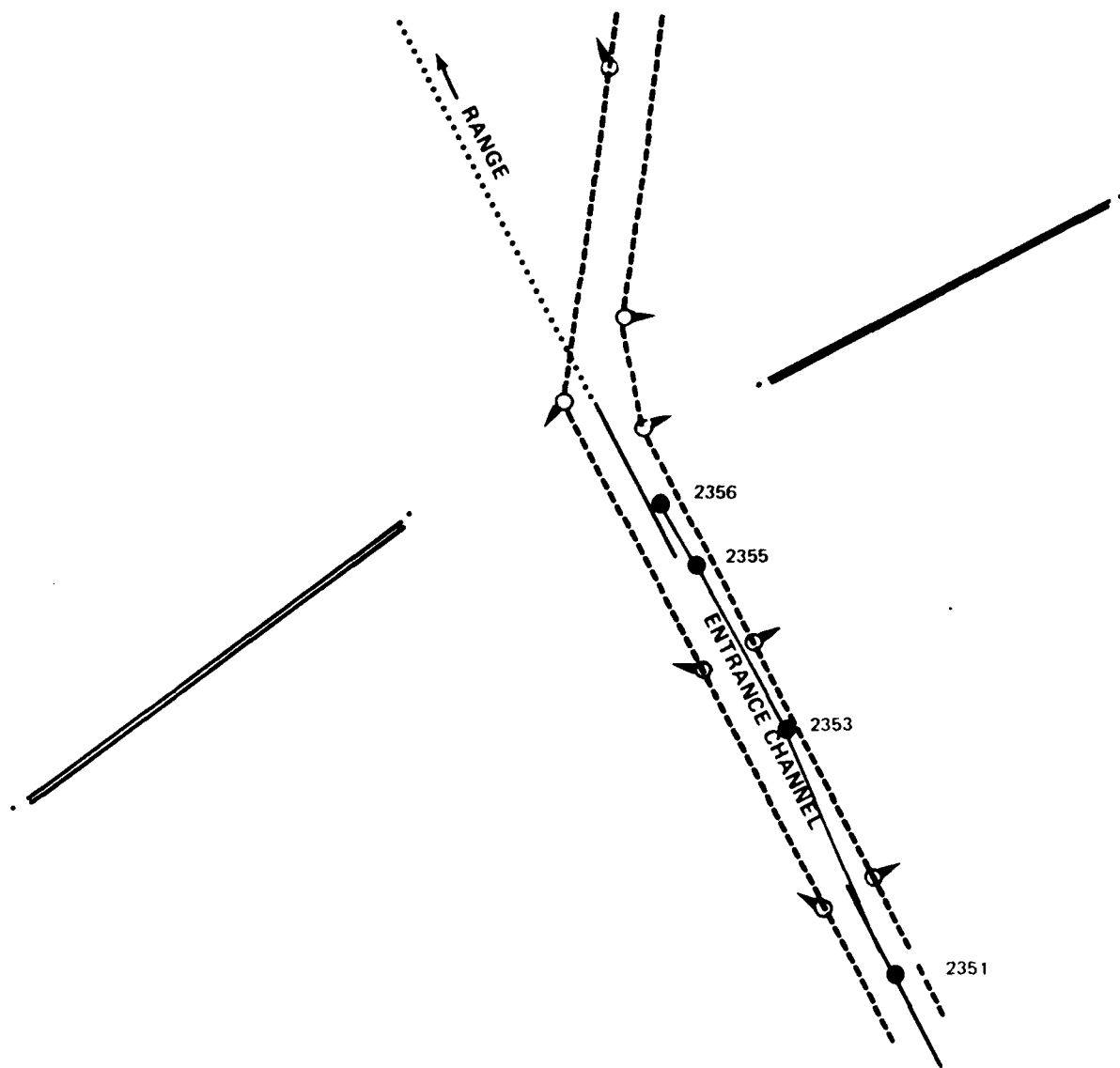
SUBJECT 1



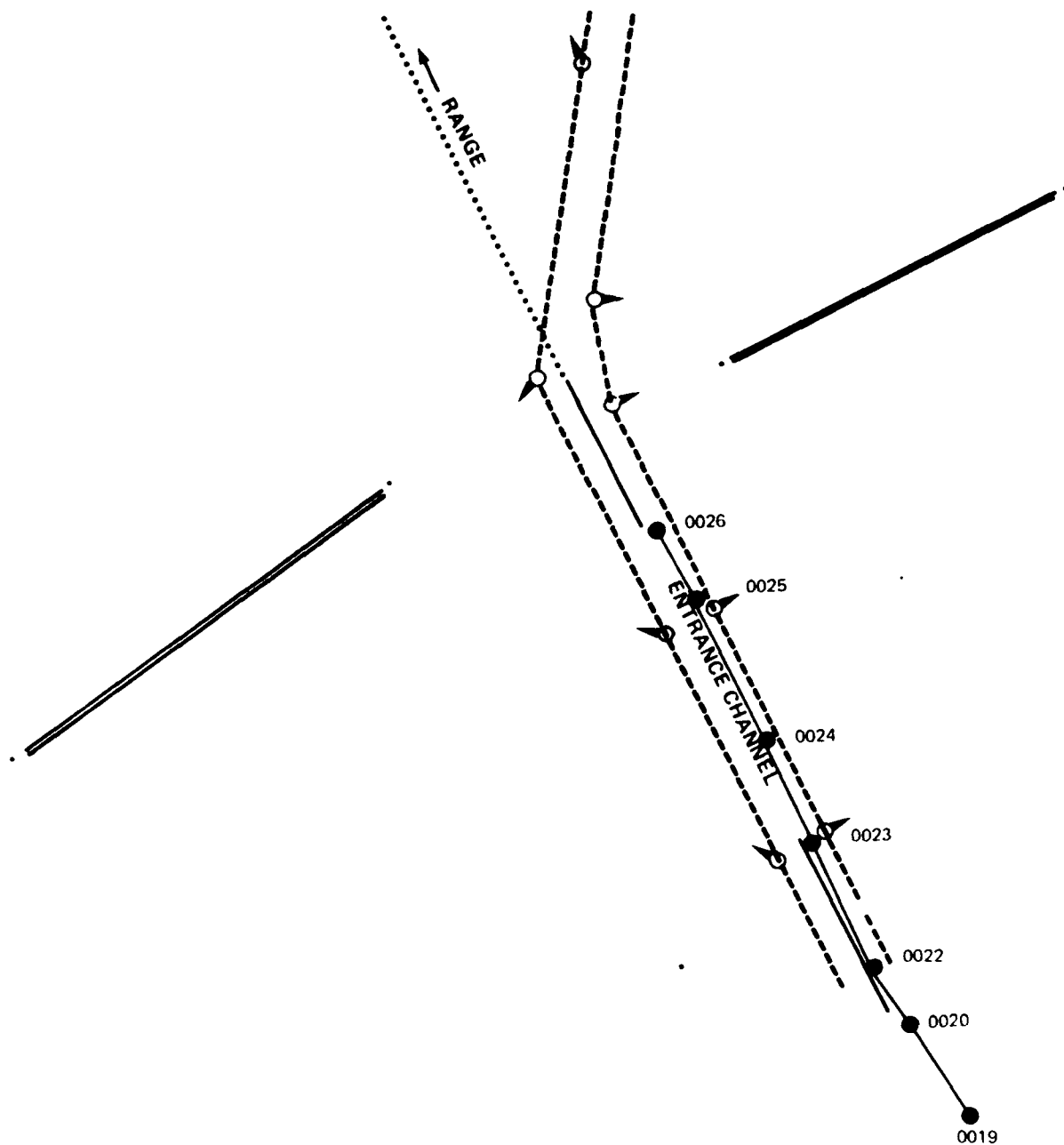
SUBJECT 2



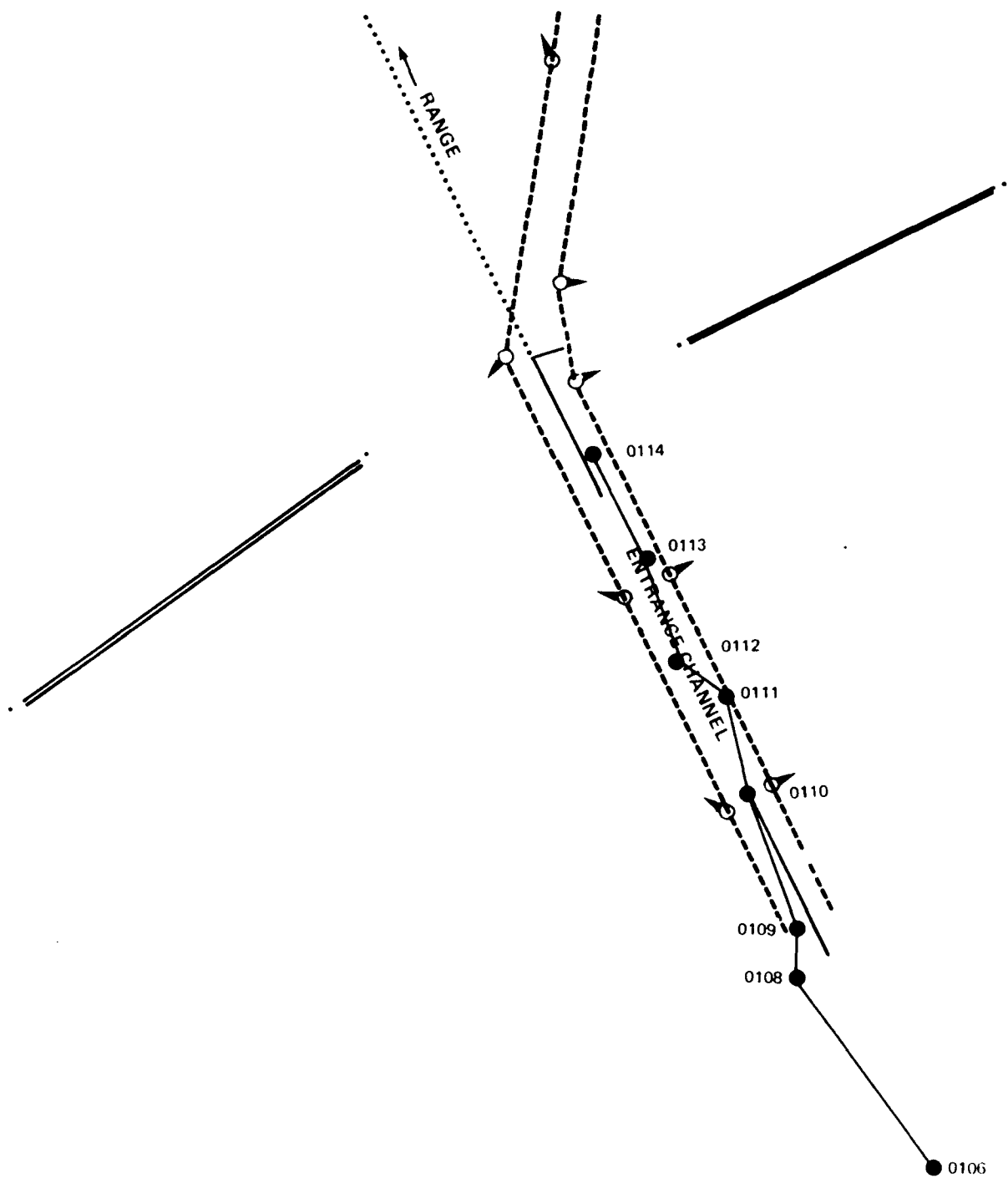
SUBJECT 3



SUBJECT 4

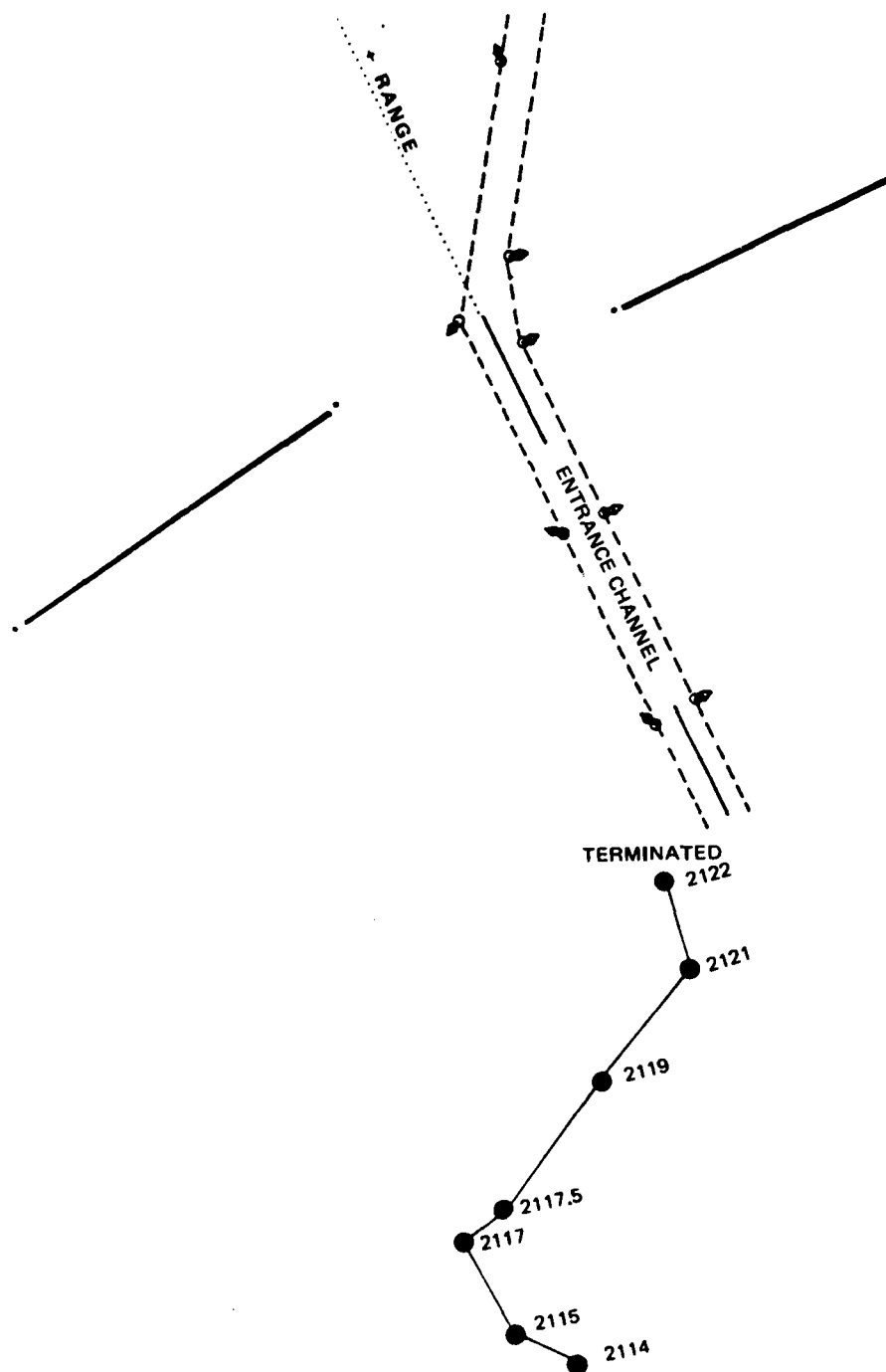


SUBJECT 5

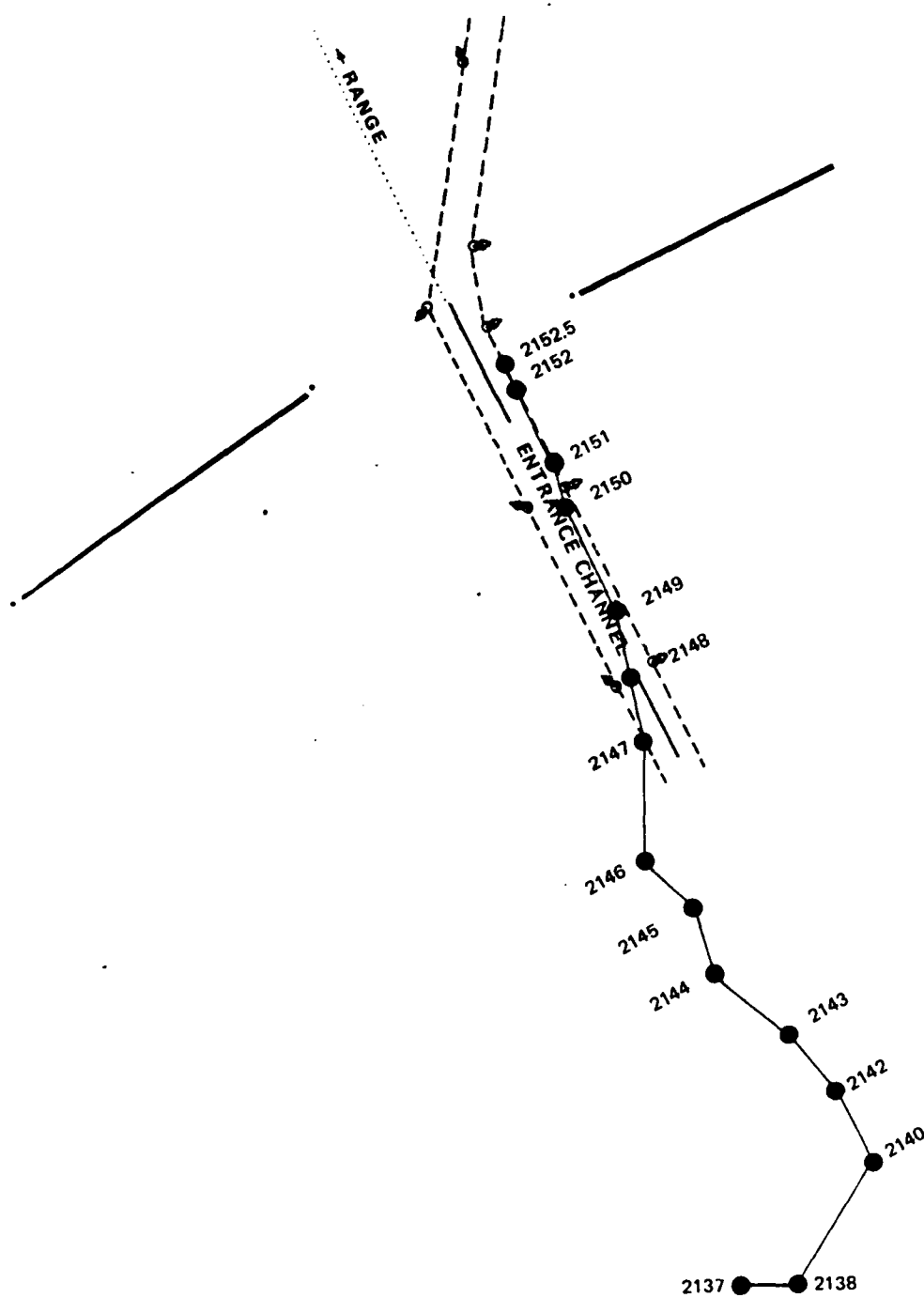


SUBJECT 6

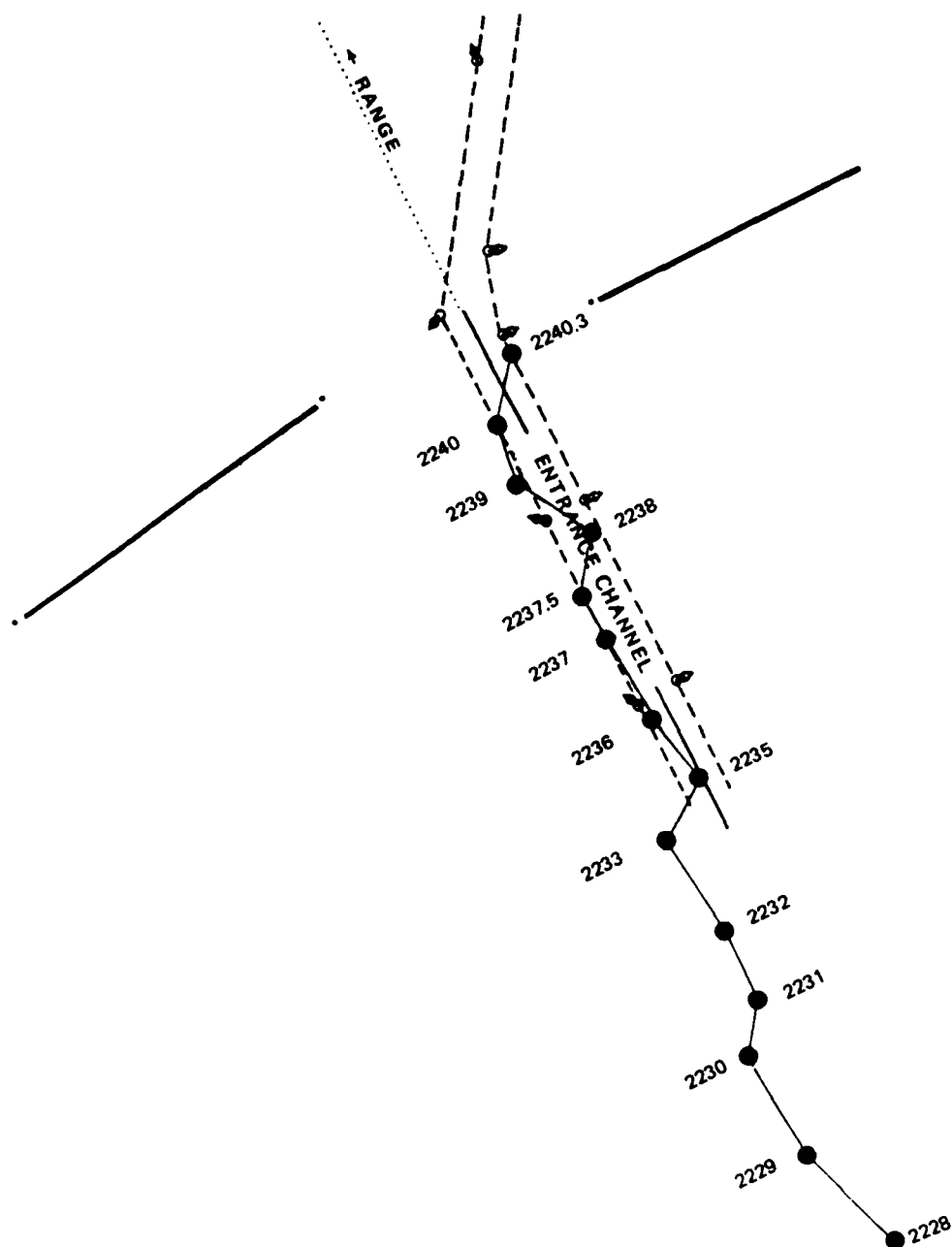
GROUP 2 — RADAR PLOTS



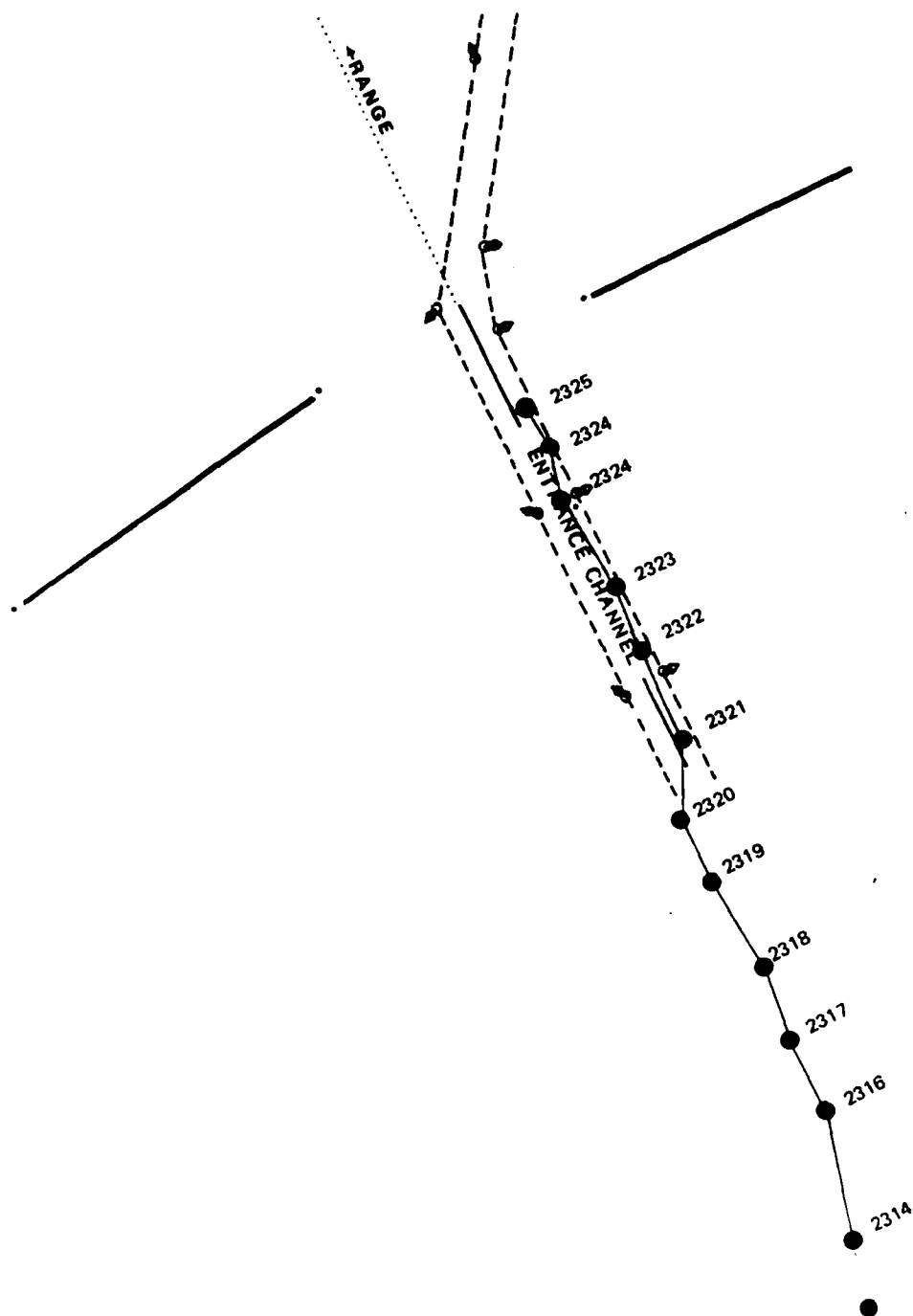
SUBJECT 1



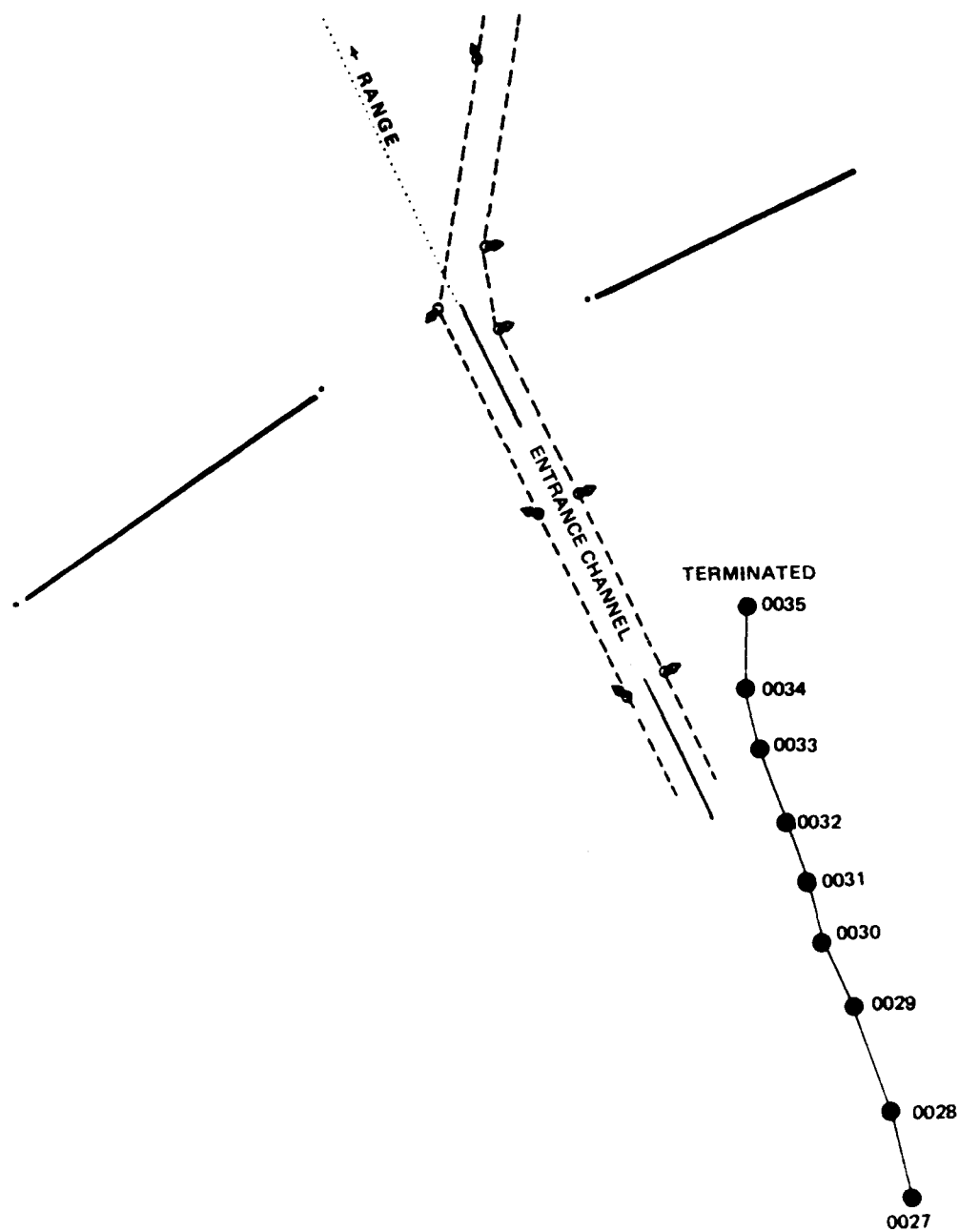
SUBJECT 2



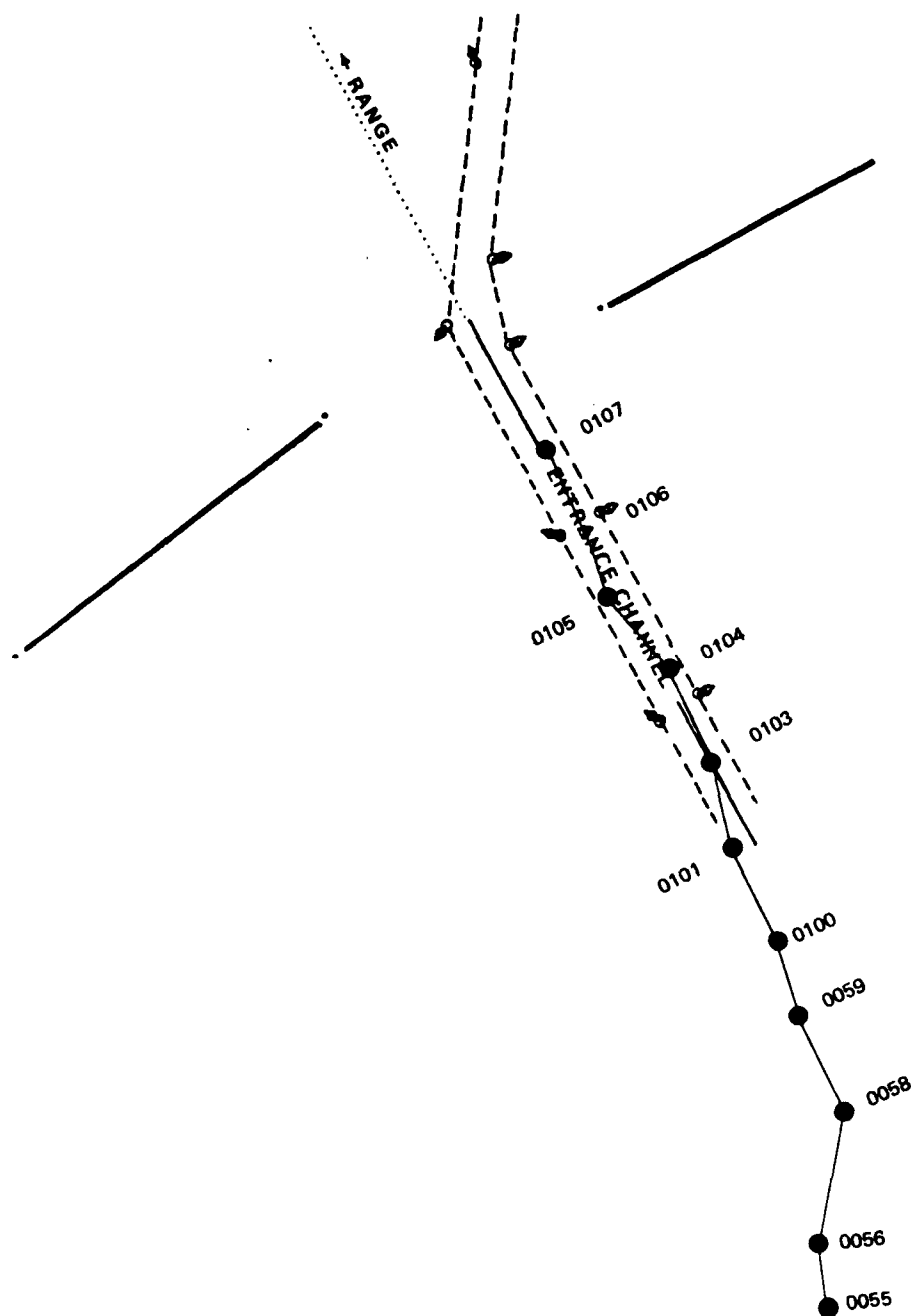
SUBJECT 3



SUBJECT 4









SUBJECT 5



SUBJECT 6

APPENDIX E

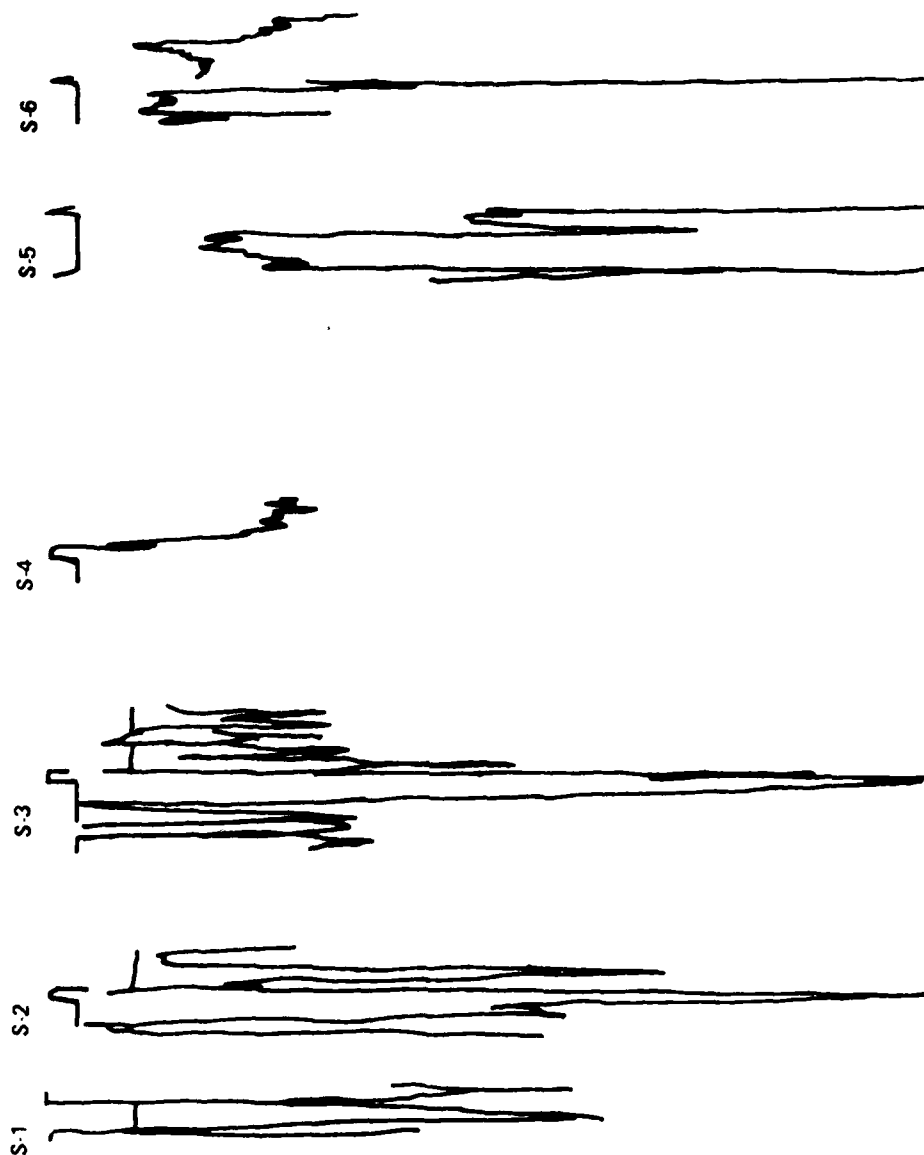
Course Recorder Results

S-6	
S-5	
S-4	
S-3	
S-2	
S-1	

**COURSE RECORDER INFORMATION FOR CADET TRIP ON
T/V KINGS POINTER**

SIMULATOR EXPERIENCED GROUP

COURSE RECORDER — GROUP 1



COURSE RECORDER INFORMATION FOR CADET TRIP ON
T/V KINGS POINTER

NON-SIMULATOR EXPERIENCED GROUP

COURSE RECORDER — GROUP 2

APPENDIX F

Result Sheets

GROUP 1 — INDIVIDUAL RESULT SHEETS

**CADET TRAINING/RESEARCH PRACTICAL
EXERCISES EVALUATION FORM**

CADET: _____ SUBJECT 1 _____

SIMULATOR GROUP: Experienced or Inexperienced

Evaluators — Visual: CMDR. MEURN

Radar: W. MILLER

1. Evaluation form

A. Highest Possible Score:	43
B. Total Score:	32
C. Percentage B/A	74.4%

2. Physical Measurements

A. Radar Fixes (Scale 1 to 5):	3
B. Percentage A/5:	60%

(1 is Poor; 5 is Excellent)

Comments: _____

C. Helm Orders —

Course Recorder

(Scale 1 to 5):	5
-----------------	---

D. Percentage C/5	100%
-------------------	------

(1 is Overabundant; 5 is Few)

Comments: _____

3. Individual Average Score

$(1C + 2B + 2D)/3$:

78.1%

CADET TRAINING/RESEARCH PRACTICAL EXERCISES EVALUATION FORM

CADET _____ SUBJECT 2 _____

SIMULATOR GROUP: Experienced or Inexperienced

Evaluators — Visual: CMDR. MEURN

Radar: W. MILLER

1. Evaluation form

A. Highest Possible Score:	43
B. Total Score:	26
C. Percentage B/A	60.5%

2. Physical Measurements

A. Radar Fixes (Scale 1 to 5):	1
B. Percentage A/5:	10%

(1 is Poor; 5 is Excellent)

Comments: _____

C. Helm Orders —

Course Recorder

(Scale 1 to 5):	1
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D. Percentage C/5:	100%
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(1 is Overabundant; 5 is Few)

Comments: _____

3. Individual Average Score

(1C + 2B + 2D)/3:

26.8%

**CADET TRAINING/RESEARCH PRACTICAL
EXERCISES EVALUATION FORM**

CADET: SUBJECT 3

SIMULATOR GROUP: Experienced or Inexperienced

Evaluators — Visual: CMDR. MEURN

Radar: W. MILLER

1. Evaluation form

A. Highest Possible Score:	<u>38</u>
B. Total Score:	<u>28</u>
C. Percentage B/A	<u>73.7%</u>

2. Physical Measurements

A. Radar Fixes (Scale 1 to 5):	<u>3</u>
B. Percentage A/5:	<u>60%</u>

(1 is Poor; 5 is Excellent)

Comments: _____

C. Helm Orders —

Course Recorder

(Scale 1 to 5):	<u>3</u>
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D. Percentage C/5:	<u>60%</u>
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(1 is Overabundant; 5 is Few)

Comments: _____

3. Individual Average Score

(1C + 2B + 2D)/3:	<div style="border: 1px solid black; padding: 5px; display: inline-block;">63.6%</div>
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**CADET TRAINING/RESEARCH PRACTICAL
EXERCISES EVALUATION FORM**

CADET: _____ SUBJECT 4 _____

SIMULATOR GROUP Experienced or Inexperienced

Evaluators — Visual: CMDR. MEURN

Radar: W. MILLER

1. Evaluation form

A. Highest Possible Score:	43
B. Total Score:	37
C. Percentage B/A	86.0%

2. Physical Measurements

A. Radar Fixes (Scale 1 to 5):	4
B. Percentage A/5:	80%

(1 is Poor; 5 is Excellent)

Comments: _____

C. Helm Orders —

Course Recorder

(Scale 1 to 5):	5
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D. Percentage C/5:	100%
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(1 is Overabundant; 5 is Few)

Comments: _____

3. Individual Average Score

(1C + 2B + 2D)/3:

88.7%

CADET TRAINING/RESEARCH PRACTICAL EXERCISES EVALUATION FORM

CADET: _____ SUBJECT 5 _____

SIMULATOR GROUP: ☒ Experienced or ☐ Inexperienced

Evaluators — Visual: CMDR. MEURN

Radar: W. MILLER

1. Evaluation form

A. Highest Possible Score:

38

B. Total Score:

29

C. Percentage B/A

76.3%

2. Physical Measurements

A. Radar Fixes (Scale 1 to 5):

5

B. Percentage A/5:

100%

(1 is Poor; 5 is Excellent)

Comments:

C. Helm Orders —

Course Recorder

(Scale 1 to 5):

3

D. Percentage C/5:

60%

(1 is Overabundant; 5 is Few)

Comments

3. Individual Average Score

$(1C + 2B + 2D)/3$:

78.8%

**CADET TRAINING/RESEARCH PRACTICAL
EXERCISES EVALUATION FORM**

CADET: SUBJECT 6 _____

SIMULATOR GROUP: Experienced or Inexperienced

Evaluators — Visual: CMDR. MEURN

Radar: W. MILLER

1. Evaluation form

A. Highest Possible Score:	43
B. Total Score:	34
C. Percentage B/A	79.1%

2. Physical Measurements

A. Radar Fixes (Scale 1 to 5):	4
B. Percentage A/5:	80%

(1 is Poor; 5 is Excellent)

Comments: _____

C. Helm Orders —

Course Recorder

(Scale 1 to 5):	3
-----------------	---

D. Percentage C/5:	60%
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(1 is Overabundant; 5 is Few)

Comments: _____

3. Individual Average Score

(1C + 2B + 2D)/3:

73%

GROUP 2 — INDIVIDUAL RESULT SHEETS

CADET TRAINING/RESEARCH PRACTICAL EXERCISES EVALUATION FORM

CADET: SUBJECT 1

SIMULATOR GROUP: Experienced or Inexperienced

Evaluators — Visual: CMDR. MEURN

Radar: W. MILLER

1. Evaluation form

A. Highest Possible Score:	<u>43</u>
B. Total Score:	<u>11</u>
C. Percentage B/A	<u>25.6%</u>

2. Physical Measurements

A. Radar Fixes (Scale 1 to 5):	<u>0</u>
B. Percentage A/5:	<u>0%</u>

(1 is Poor; 5 is Excellent)

Comments: ABORTED RUN CADET LOST

C. Helm Orders —

Course Recorder

(Scale 1 to 5):	<u>0</u>
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D. Percentage C/5:	<u>0%</u>
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(1 is Overabundant; 5 is Few)

Comments: ALL OVER THE PLACE

3. Individual Average Score

(1C + 2B + 2D)/3:

8.5%

CADET TRAINING/RESEARCH PRACTICAL EXERCISES EVALUATION FORM

CADET: _____ SUBJECT 2 _____

SIMULATOR GROUP: Experienced or Inexperienced

Evaluators — Visual: CMDR. MEURN

Radar: W. MILLER

1. Evaluation form

A. Highest Possible Score:

48

B. Total Score:

20

C. Percentage B/A

41.7%

2. Physical Measurements

A. Radar Fixes (Scale 1 to 5):

3

B. Percentage A/5:

60%

(1 is Poor; 5 is Excellent)

Comments:

C. Helm Orders —

Course Recorder

(Scale 1 to 5):

1

D. Percentage C/5:

20%

(1 is Overabundant; 5 is Few)

Comments:

3. Individual Average Score

$(1C + 2B + 2D)/3:$

40.6%

**CADET TRAINING/RESEARCH PRACTICAL
EXERCISES EVALUATION FORM**

CADET: SUBJECT 3

SIMULATOR GROUP: Experienced or Inexperienced

Evaluators — Visual: CMDR. MEURN

Radar: W. MILLER

1. Evaluation form

A. Highest Possible Score:	48
B. Total Score:	19
C. Percentage B/A	39.6%

2. Physical Measurements

A. Radar Fixes (Scale 1 to 5):	2
B. Percentage A/5:	40%

(1 is Poor; 5 is Excellent)

Comments: _____

C. Helm Orders —

Course Recorder

(Scale 1 to 5):	1
-----------------	---

D. Percentage C/5:	20%
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(1 is Overabundant; 5 is Few)

Comments: _____

3. Individual Average Score

(1C + 2B + 2D)/3:

33.2%

**CADET TRAINING/RESEARCH PRACTICAL
EXERCISES EVALUATION FORM**

CADET

SUBJECT 4

SIMULATOR GROUP: Experienced or Inexperienced

Evaluators — Visual: CMDR. MEURN

Radar: W. MILLER

1. Evaluation form

A. Highest Possible Score:

48

B. Total Score:

19.5

C. Percentage B/A

40.6%

2. Physical Measurements

A. Radar Fixes (Scale 1 to 5):

3

B. Percentage A/5:

60%

(1 is Poor; 5 is Excellent)

Comments:

C. Helm Orders —

Course Recorder

(Scale 1 to 5):

3

D. Percentage C/5:

60%

(1 is Overabundant; 5 is Few)

Comments:

3. Individual Average Score

$(1C + 2B + 2D)/3$

53.5%

CADET TRAINING/RESEARCH PRACTICAL EXERCISES EVALUATION FORM

CADET

SUBJECT 5

SIMULATOR GROUP Experienced or Inexperienced

Evaluators - Visual: CMDR. MEURN

Radar: W. MILLER

1. Evaluation form

A. Highest Possible Score:	48
B. Total Score:	9
C. Percentage B/A	18.7%

2. Physical Measurements

A. Radar Fixes (Scale 1 to 5):	0
B. Percentage A/5:	0%

(1 is Poor; 5 is Excellent)

Comments:

ABORTED THE RUN—NEVER UNDERSTOOD THE
PURPOSE OF A RANGE

C. Helm Orders —

Course Recorder

(Scale 1 to 5):	1
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D. Percentage C/5:	20%
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(1 is Overabundant; 5 is Few)

Comments:

3. Individual Average Score

(1C + 2B + 2D)/3:

12.9%

CADET TRAINING/RESEARCH PRACTICAL EXERCISES EVALUATION FORM

CADET SUBJECT 6 _____

SIMULATOR GROUP Experienced or Inexperienced

Evaluators Visual CMDR. MEURN

 Radar W. MILLER

1 Evaluation form

A Highest Possible Score:	_____ 43 _____
B Total Score	_____ 25 _____
C Percentage B/A	_____ 58.1% _____

2 Physical Measurements

A Radar Fixes (Scale 1 to 5):	_____ 4 _____
B Percentage A/5	_____ 80% _____

(1 is Poor, 5 is Excellent)

Comments _____

C Helm Orders

Course Recorder

(Scale 1 to 5)	_____ 2 _____
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D Percentage C/5	_____ 40% _____
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(1 is Overabundant, 5 is Few)

Comments _____

3 Individual Average Score

(1C + 2B + 2D)/3

59.4%

Total Group Score

A. Simulator Experienced Group

Cadet	Individual Average Score (Line 3 Individual Forms)
S-1	78.1
S-2	26.8
S-3	64.6
S-4	88.7
S-5	78.8
S-6	73.0
Total	
Avg Score	68.3%

B. Simulator Inexperienced Group

Cadet	Individual Average Score (Line 3 Individual Forms)
S-1	8.5
S-2	40.6
S-3	33.2
S-4	53.5
S-5	12.9
S-6	59.4
Total	
Avg Score	34.7%

END

DT/C

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